ثانوية التكنولوجيا التطبيقية
Applied Technology High School

ATHS FC – Math Department Al Ain
Assignment 2 (Term I)-Grade 11 Regular

Sect	[redacted]	Due Date	Oct 1st, 2014
Na		Lesson	12.9 Inverse Trigonometric Functions 13.1 Trigonometric Identities
I		Marks	/5

Find each value. Write angle measures in degrees and radians.

1. arcsin 1

$90°, \frac{\pi}{2}$ ✓

2. $\cos^{-1}\left(-\frac{\sqrt{2}}{2}\right)$

$135°, \frac{3}{4}\pi$ ✓

3. $\tan^{-1}\left(-\frac{\sqrt{3}}{3}\right)$

$-30°, \frac{\pi}{6}$ ✓

Find each value. Round to the nearest hundredth if necessary.

4. $\tan\left(\sin^{-1}\frac{12}{13}\right)$

$\tan(67.38)$

$= 2.40$ ✓

5. $\sin\left(\arctan\frac{\sqrt{3}}{3}\right)$

$\sin(30)$

$= 0.50$ ✓

6. $\cos\left(\arctan\frac{3}{4}\right)$

$\cos(36.8698)$

$= 0.80$ ✓

Solve each equation. Round to the nearest tenth if necessary.

7. $\cos\theta = 0.05$

$\theta = \cos^{-1}(0.05)$

$\theta = 87.1°$ ✓

8. $\tan\theta = 0.22$

$\theta = \tan^{-1}(0.22)$

$\theta = 12.4°$ ✓

9. $\sin\theta = -0.03$

$\theta = \sin^{-1}(-0.03)$

$\theta = -1.7°$ ✓

S	A
T	C

Find the exact value of each expression if $0° < \theta < 90°$. A + I

10. *If* $\cos\theta = \frac{5}{13}$, *find* $\sin\theta$.

$\cos^2\theta + \sin^2\theta = 1$

$\left(\frac{5}{13}\right)^2 + \sin^2\theta = 1$

$\sin^2\theta = 1 - \frac{25}{169}$

$\sqrt{\sin^2\theta} = \sqrt{\frac{144}{169}}$

$\sin\theta = \pm\frac{12}{13}$

$\sin\theta = \frac{12}{13}$ ✓

11. *If* $\cot\theta = \frac{1}{2}$, *find* $\sin\theta$.

$\cot^2\theta + 1 = \csc^2\theta$

$\left(\frac{1}{2}\right)^2 + 1 = \csc^2\theta$

$\sqrt{\csc^2\theta} = \sqrt{\frac{5}{4}}$

$\csc\theta = \pm\frac{\sqrt{5}}{2} = \frac{\sqrt{5}}{2}$

$\sin\theta = \frac{1}{\csc\theta}$

$\sin\theta = \frac{1}{\sqrt{5}/2}$

$\sin\theta = \frac{2\sqrt{5}}{5}$ ✓

Find the exact value of each expression if $180° < \theta < 270°$. III

12. If $\sin\theta = -\frac{15}{17}$, find $\sec\theta$. −

$\cos^2\theta + \sin^2\theta = 1$ $\frac{225}{289}$

$\cos^2\theta + \left(\frac{-15}{17}\right)^2 = 1$

$\sqrt{\cos^2\theta} = \sqrt{\frac{64}{289}}$

$\cos\theta = \pm\frac{8}{17}$

$\cos\theta = -\frac{8}{17}$

$\sec\theta = \frac{1}{\cos\theta}$

$\sec\theta = \frac{1}{-8/17}$

$\sec\theta = -\frac{17}{8}$ ✓

13. If $\csc\theta = -\frac{3}{2}$, find $\cot\theta$. +

$\cot^2\theta + 1 = \csc^2\theta$

$\cot^2\theta + 1 = \left(-\frac{3}{2}\right)^2$

$\sqrt{\cot^2\theta} = \sqrt{\frac{5}{4}}$

$\cot\theta = \pm\frac{\sqrt{5}}{2}$

$\cot\theta = \frac{\sqrt{5}}{2}$ ✓

Find the exact value of each expression if $270° < \theta < 360°$. IV

14. If $\cos\theta = \frac{3}{10}$, find $\cot\theta$. −

$\sec\theta = \frac{1}{\cos\theta}$

$\sec\theta = 10/3$

$\tan^2\theta + 1 = \sec^2\theta$

$\tan^2\theta + 1 = (10/3)^2$

$\sqrt{\tan^2\theta} = \sqrt{\frac{91}{9}}$

$\tan\theta = -\frac{\sqrt{91}}{3}$

$\cot\theta = \frac{1}{\tan\theta}$

$\cot\theta = \frac{1}{-\sqrt{91}/3}$

$\cot\theta = -\frac{3\sqrt{91}}{91}$ ✓

15. If $\csc\theta = -8$, find $\sec\theta$. +

$\sin\theta = \frac{1}{\csc\theta}$

$\sin\theta = -\frac{1}{8}$

$\cos^2\theta + \sin^2\theta = 1$

$\cos^2\theta + \frac{-1}{8} = 1$

$\cos\theta = \frac{3\sqrt{7}}{8}$

$\sec\theta = \frac{1}{\cos\theta}$

$\sec\theta = \frac{8\sqrt{7}}{21}$ ✓

Simplify each expression.

16. $\csc\theta \tan\theta$

$\frac{1}{\sin\theta} \times \frac{\sin\theta}{\cos\theta}$

$\frac{1}{\cos\theta}$

$= \sec\theta$ ✓

17. $\frac{\sin^2\theta}{\tan^2\theta}$

$\sin^2\theta$

$\frac{\sin^2\theta}{\frac{\sin^2\theta}{\cos^2\theta}}$

$\sin^2\theta \left(\frac{\cos^2\theta}{\sin^2\theta}\right)$

$= \cos^2\theta$ ✓

18. $\frac{\cos\theta}{1-\sin\theta} - \frac{\cos\theta}{1+\sin\theta}$ $\times 1+\sin\theta$ $\times 1-\sin\theta$

$\frac{\cos(1+\sin\theta) - \cos(1-\sin\theta)}{1-\sin^2\theta}$

$\frac{\cos\theta((1-\sin\theta)-(1-\sin\theta))}{\cos^2\theta}$

$\frac{1+\sin\theta-1+\sin\theta}{\cos\theta}$

$\frac{2\sin\theta}{\cos\theta} = 2\tan\theta$

19. $\sec^2\theta \cos^2\theta + \tan^2\theta$

$\frac{1}{\cos^2\theta} \times \cos^2\theta + \tan^2\theta$

$= 1 + \tan^2\theta$

$= \sec^2\theta$ ✓